

## Claims

We claim:

- 1 1. A method for equalizing a signal transmitted via a channel of a communications  
2 system, comprising:  
3       storing a training signal received via the channel in a circular buffer as a  
4 circulating training signal;  
5       minimizing a mean square error of the training signal while estimating the  
6 training signal;  
7       determining if the mean square error is greater than a predetermined  
8 threshold, and minimizing the mean square error of the circulating training signal  
9 and the estimate of the training signal until the mean square error is less than the  
10 predetermined threshold; and  
11       equalizing an input signal received directly via the channel to make decisions  
12 on symbols of the signal transmitted via the channel if the mean square error is less  
13 than the predetermined threshold.
- 1 2. The method of claim 1 wherein the training signal includes a sequence of symbols,  
2 and the number of symbols in the sequence is less than five.
- 1 3. The method of claim 1 wherein the predetermined threshold is a target mean  
2 square error.

1 4. A system for equalizing a signal transmitted via a channel of a communications  
2 system, comprising:

3 a main buffer configured to store an input signal received via the channel;  
4 a circular buffer configured to store a training signal of the input signal as a  
5 circulating training signal;  
6 an equalization and decision device;  
7 a desired response generator coupled to the equalization and decision device;  
8 a circulation trigger coupled to the equalization and decision device; and  
9 a switch controlled by the circulation trigger, the switch feeding the training  
10 signal to the equalization and decision device during training stages, and the switch  
11 feeding the input signal to the equalization and decision device during an  
12 equalization stage.

1 5. The system of claim 4 further comprising:

2 means for minimizing a mean square error of the training signal while  
3 estimating the training signal;

4 means for determining if the mean square error is greater than a  
5 predetermined threshold, and minimizing the mean square error of the circulating  
6 training signal and the estimate of the training signal until the mean square error is  
7 less than the predetermined threshold; and

8 means for equalizing the input signal received directly via the channel to  
9 make decisions on symbols of the signal transmitted via the channel if the mean  
10 square error is less than the predetermined threshold.